

ZOOLOGY.—*A review of the snakes of the genus Ficimia.*<sup>1</sup> HOBART M. SMITH, Smithsonian Institution, and EDWARD H. TAYLOR, University of Kansas. (Communicated by HERBERT FRIEDMANN.)

In 1936 Taylor<sup>2</sup> reviewed most of the species of *Ficimia* known from Mexico, including a very distinct new species discovered by him in Sonora (*desertorum*). This review was based on material available in the EHT-HMS collection and of necessity was not complete.

While the collection of the U. S. National Museum also lacks certain species (*desertorum*, *quadrangularis*, *ruspator*), it does contain a number of specimens that present new and noteworthy information on distribution and variation of other species in the genus. This material, combined with that now present in the EHT-HMS collection, makes possible a redefinition of the several species and an evaluation of certain specific and generic characters of species and groups of species.

Two groups are apparent in *Ficimia* (*sensu lato*), one (*olivacea* group [= *Ficimia*, *sensu stricto*]) containing *publia*, *variegata*, a new species described below as *ruspator*, *olivacea*, and *streckeri*, the other (*cana* group [= *Gyalopion*]) containing *cana*, *quadrangularis*, and *desertorum*. The association of the latter with the *cana* group is open to question, since the species has two characters that (if normal) distinguish it from all others, not only of the group, but of the genus (entire anal, a loreal<sup>3</sup>). However, it agrees with the *cana* group in pattern and in having the rostral separated from the frontal by contact of the prefrontals. The latter is one of the chief characteristics of the *cana* group, and since *desertorum* seems to be directly ancestral to the other two species of the group, there is little gained by placing it in another group or genus.

The two groups differ from each other in contact (or separation) of the rostral from the frontal and in number of ventrals and subcaudals. The *olivacea* group has the rostral in contact with the frontal, ventrals 140 to 160, and caudals 32 to 42. The *cana* group has the rostral separated from the frontal by contact medially of the two prefrontals, and has 129 to 146 ventrals and 23 to 36 caudals. No hemipenial differences are discernible, and differences in dentition are slight (see following discussion).

The members of the *olivacea* group are differentiated by variations

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<sup>2</sup> Taylor, E. H., Proc. Biol. Soc. Washington, 49: 51-54. 1936.

<sup>3</sup> The entire anal may not be normal, as one specimen of *publia* has it the same. The loreal is not completely unique, either, as one *cana* possesses a loreal (see Fig. 16).

in pattern (presence, absence, number, and width of blotches), by presence or absence of internasals, and by number of postoculars. Every member (with one exception) has a distinctive pattern, which fortunately is subject to less intraspecific variation (without interspecific overlap, so far as now known) than the two varying characters of scutellation (which do overlap interspecifically). Accordingly pattern is the primary medium of differentiation in the process of speciation in the genus. Scutellation is more generally constant throughout the group, is less readily affected than pattern, and differentiations that have occurred in it are less well stabilized. In both pattern and scutellation, however, there is a definite, orthogenetic trend toward reduction and simplification.

In the *cana* group also pattern is the chief medium of species differentiation. *F. cana* and *quadrangularis* are differentiated from each other largely by pattern characters resulting from two different modes of reduction from a pattern type such as possessed by *desertorum*. Differentiation in scutellation has also occurred, however, and by the same process (simplification by fusion, the loreal of *desertorum* rarely present in *cana* and *quadrangularis*, fused with the prefrontal), carried out during long periods of isolation (i.e., separation from parent stock), as in the *olivacea* group. In both pattern and scutellation *desertorum* is the most primitive of the group. If we regard this species as representing a type ancestral to the other two species, then the two orthogenetic trends evident in the *olivacea* group are quite as obvious in the *cana* group.

In the center of dispersal of the *olivacea* group is *publia*, which we believe is the most primitive of that group, since it is the only one normally with internasals; its pattern is also one from which the other pattern types conceivably may have been derived. The trends of evolution in the group are toward elimination of the blotched pattern (through production of many small spots) and fusion of the head scales. Essentially two lines of divergence, each showing these trends of evolution, from the *publia* stock, are evident: one on the Atlantic coast, marked by extremes of fusion of head scales and of pattern reduction, and one on the Pacific coast, marked by lesser pattern reduction and little fusion of head scales. The Pacific coast branch is now split into two geographic (and specific) populations, one south (east) of the Isthmus of Tehuantepec (*variegatus*), the other north (west) of the Isthmus (*ruspator*). In the Isthmus itself is *publia*. In this line pattern reduction has proceeded but little; the dorsal spots are well defined, and only more numerous and a little narrower than

in *publia*. In scutellation also little change has occurred, the northern form retaining the scutellation of *publia*, the southern form losing the internasals (by fusion with the prefrontals).

Two species (*streckeri* and *olivacea*) have emerged from the Atlantic coast branch also, but in this the pattern is totally eliminated in one (*olivacea*), nearly so in the other (*streckeri*); both have lost the internasals, and *streckeri* marks the extreme in structural specialization in the genus by fusion of the two postoculars.

In the *cana* group, by its possession of a loreal and a generalized pattern, *desertorum* should be ancestral to *cana* and *quadrangularis*; its central geographic position in Sonora supports this view. Its entire anal (apparently a specialized character) may have developed after the evolution of *cana-quadrangularis* stock (in which case each stem possesses a specialized character in scutellation), or unfortunately it may be an aberrant character appearing in the single known specimen.

It is obvious from the foregoing discussion that two widely different stocks, long isolated from each other, are at present included in *Ficimia*, in the arrangement proposed by Boulenger (Cat. Snakes, vol. 2, 1894). These have different centers of dispersal (Fig. 11), different ranges, and different morphological characters, and while obviously related their common ancestry seems very remote. They are units possessing the characters defining them as genera according to present usage of that term; they fit that definition much better than some genera at present generally recognized. Accordingly the eight species of these two units are segregated in the genera *Gyalopion* and *Ficimia*.

#### Genus *Gyalopion* Cope

*Gyalopion* Cope, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 243.

*Genotype*.—*Gyalopion canum* Cope, *loc. cit.*, by monotypy.

*Diagnosis*.—Maxillary teeth 12 to 15, subequal, no diastemata, some with very distinct, shallow, lateral depressions, all or most others with some evidence of same; body short, cylindrical, head not distinct from neck; eye small; pupil round; snout projecting, pointed; rostral large, separated from frontal by prefrontals; internasals present; loreal present or absent; anterior section of nasal usually fused with first labial; one anterior temporal; posterior chinshields very small; scales smooth, with single apical pits; ventrals 129 to 146; caudals 23 to 36; hemipenis undivided, distal half or two-thirds calyces, a small adjacent (proximally) area spines, basal sixth ridges, sulcus single.

*Remarks*.—Because of the constant presence of internasals, presence of a loreal in two specimens, and constant separation of the rostral from the frontal, this genus is, in general, more primitive than *Ficimia*. That it is not directly ancestral to it is attested by the peculiar pattern, reduced ventral and caudal count, and peripheral distribution (with a different center of dispersal).

***Gyalopion desertorum* (Taylor)**

Figs. 2, 7, 15

*Ficimia desertorum* Taylor, Proc. Biol. Soc. Washington 49: 51-52. 1936 (12 kilometers northwest of Guaymas, Sonora); Kansas Univ. Sci. Bull. 24: 494, pl. 43, fig. 1. 1936 (1938).

*Diagnosis*.—Rostral separated from frontal by prefrontals; a loreal; anal single (normal?); blotches entirely black on middorsum; nuchal spot extending onto frontal and supraocular region; ground color reddish, except on middorsum.

*Specimens examined*.—One, the type, the only known specimen (EHT-HMS 4576).

*Remarks*.—From *canum* and *quadrangularis* this species differs by possessing a loreal, perhaps in having a single anal, and in color pattern. The latter is more like that of *quadrangularis* than *canum*, since in both the spots are uniform black (not brown, black-edged as in *canum*) and the nuchal spot is fused across the middorsal occipital region with another black spot on the top of head which involves the frontal and extends laterally through and below the eyes.

In *quadrangularis*, however, the spots are less numerous (26 on body, 5 on tail; in *desertorum*, 32 on body, 8 on tail), and they are restricted to the middorsal region, the sides being unmarked. In *desertorum* the blotches extend laterally to the edge of the ventrals, but on the sides of the body a broad, central area of each scale in the blotches is light, the dark area restricted to the edges of the scales. Only the nuchal blotch is uniform black on the sides of the body.

The reddish (magenta) dorsal ground color (cream on middorsum) of *desertorum* is a very noteworthy and surprising development. This color is very striking in life, although not evident after six years in preservative: the local residents called the snake a coralillo. Since red occurs in no other species of either *Gyalopion* or *Ficimia* (so far as now known; *quadrangularis* may have it), its significance is not readily obvious. Presumably it is a specialization.

The maxilla has 13 subequal teeth, most of them feebly grooved laterally; extreme anterior tip toothless.

The hemipenis is 10 caudals long; distal three caudal lengths calcyces; adjacent five caudal lengths spines, the size increasing proximally; two large basal spines; remaining area at base ridged, each ridge surmounted by tiny spines; sulcus single.

*G. desertorum* differs from all others of its genus and of *Ficimia* (so far as known) in the presence of tiny spines on the proximal portion of the hemipenis, and by the presence of a loreal (latter not completely unique). With some reason the species could be separated in a monotypic genus, especially if the single anal proves constant. We have refrained from doing so because it appears to be directly ancestral to *canum* and *quadrangularis*.

***Gyalopion quadrangularis* (Günther)**

*Ficimia quadrangularis* Günther, Biol. Centr. Amer., Rept., p. 99, pl. 35, fig. A. 1893 (Presidio, near Mazatlán, Sinaloa).

*Diagnosis*.—Rostral separated from frontal by prefrontals; no loreal; anal divided; no spots on sides of body, only markings a series of 26 rounded or subquadrangular, uniform blackish-brown spots on body, 5 on tail; spots not extending below fifth scale row, sides of body below this nearly white; nuchal spot confluent with interocular dark bar.

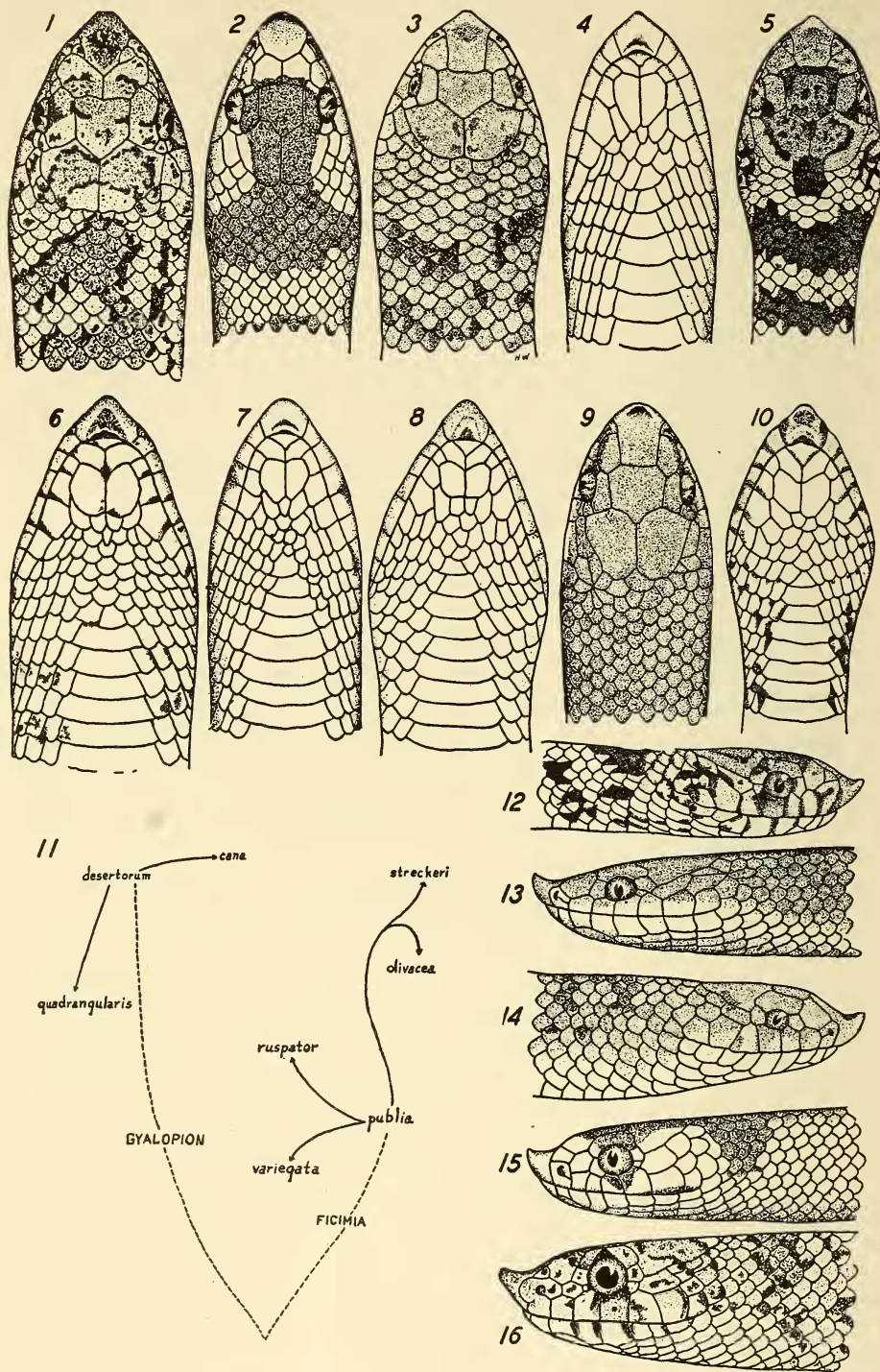


Fig. 1.—(See opposite page for legend).

*Specimens examined*.—None. Apparently none in American museums; type in British Museum.

*Remarks*.—This species does not differ from *canum* in scutellation. Günther points out that the seventh labial is very small, but the size of this scale varies greatly at least in *Ficimia publia*, and possibly also in *quadrangularis*. Some *publia* have it considerably smaller than the tertiary temporals (as in *quadrangularis*), others have it much larger.

Pattern differences from *canum* are obvious; spots fewer (30 to 39 in *canum*), head markings black, fused with first nuchal spot (not in *canum*), no marks on sides (secondary spots on sides in *canum*, dorsal spots also extending on sides), all spots black (brown, black-edged, in *canum*). It has fewer spots than *desertorum*, and the spots are restricted to the middorsal region, but otherwise it is much like the latter, from which its pattern obviously is derived.

***Gyalopion canum* Cope** Figs. 1, 6, 16

*Gyalopion canum* Cope, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 243 (Fort Buchanan, Ariz.; U.S.N.M. nos. 16427-8).

*Ficimia cana* Garman, Mem. Mus. Comp. Zool. 8: 83, 161. 1883; Van Denburgh, Occ. Papers California Acad. Sci. 10: 777-779. 1922; Taylor, Copeia, 1931, no. 1, pp. 4-5.

*Diagnosis*.—Rostral separated from frontal by prefrontals; no loreal; anal divided; spots on body 30 to 39, on tail 9 to 12; spots brown, black-edged, broken laterally or continuous with lateral spots, reaching nearly to ventrals; irregular, small spots scattered on sides of body.

*Specimens examined*.—Four.

*Range*.—Southeastern Arizona east to Tom Green County, Tex.; south to the Chisos Mountains, Tex. Not yet recorded from Mexico.

*Locality records*.—ARIZONA: Fort Buchanan (U.S.N.M. nos. 16427-8); Montezuma Canyon, Huachuca Mountains (Van Denburgh). NEW MEXICO: White Sands, Alamogordo (Van Denburgh); 10 miles north of Florida, Luna County (Kans. Univ. nos. 6616-7). TEXAS: Green Gulch, Chisos Mountains (U.S.N.M. no. 103654); Tom Green County (Baylor Univ. no. 6015); El Paso (Van Denburgh).

*Remarks*.—The color pattern of this species is markedly different from that of the other two species of the genus in having the blotches light-centered and black-edged, and a different head and neck pattern. An interocular dark bar, bordered by light anteriorly and posteriorly, is visible in this species; a similar bar extends across the middle of the parietals; the nuchal blotch does not extend onto the head. The pattern is conceivably derived from that of *desertorum*, in which the blotches number about the same, but are solid black. The

Figs. 1, 6, 16.—Cephalic scutellation of *Gyalopion canum*, from K.U. no. 6616, Florida, N. M. Loreal and small lower preocular not usually present.

Figs. 2, 7, 15.—Cephalic scutellation of *Gyalopion desertorum*, from holotype, EHT-HMS no. 4576, Guaymas, Sonora.

Figs. 3, 8, 14.—Cephalic scutellation of *Ficimia streckeri*, from holotype, K.U. no. 9140, Rio Grande City, Tex.

Figs. 4, 9, 13.—Cephalic scutellation of *Ficimia olivacea*, from EHT-HMS no. 4575, Tierra Colorada, Veracruz.

Figs. 5, 10, 12.—Cephalic scutellation of *Ficimia ruspator*, from holotype, EHT-HMS no. 23646, Tixtla, Guerrero.

Fig. 11.—Diagrammatic representation of the possible phylogeny of *Gyalopion* and *Ficimia*.

latter feature seems to be the primitive condition in *Ficimia* as well as in *Gyalopion*, since southern (presumably most primitive) *publia* have the spots nearly or quite solidly black.

TABLE 1.—VARIATION IN GYALOPION CANUM

Number	Sex	Ventrals	Caudals	Supral.	Infral.	Proc.	Ptoc.	Ptoc.	Body spots	Tail spots
6617	♂	134	35	7-7	7-7	1-1	1-2	1-1	39	12
103654	♂	136	30	7-7	7-7	1-1	2-2	1-1	34	12
5284	♀	136	27	7-7	7-8	1-1	2-2	1-1	30	9
6616	♀	143	31	7-7	8-8	2-2	2-2	1-1	36	9
6015	♀	141	31	7-7	7-7	1-1	2-2	1-1	36	11
Brit. M.	♀	131	28	7-7		1-1	2-2	1-1		
Ruthven	♀?	145	29	7-7	7-8	1-1	2-2	1-1	40	9

Maxilla with 12 teeth, all with moderately distinct to faint, lateral depressions or grooves; tip toothless.

Hemipenis (of K.U. no. 6617) about 14 caudals long; distal half calyces, these extending a little farther proximally along sulcus; nearly all of remainder spines; two large basal spines; extreme basal portion ridged, without spicules.

One specimen (no. 6617) has the first labial completely separated from the nasal. Another from the same locality has a loreal and a small, lower preocular (Fig. 16).

#### Genus *Ficimia* Gray

*Ficimia* Gray, Cat. Snakes Brit. Mus., p. 80. 1849.

*Amblymetopon* Günther, Cat. Snakes Brit. Mus., p. 7. 1858 (genotype, *variegatum*, by monotypy).

*Genotype*.—*Ficimia olivacea* Gray, *loc. cit.*, by monotypy.

*Diagnosis*.—Like *Gyalopion*, except: Maxillary teeth with very faint lateral grooves or depressions; rostral in contact with frontal, separating prefrontals medially; loreal absent; internasals present or absent (fused); ventrals 140 to 160, caudals 32 to 42.

#### *Ficimia publica* Cope

*Ficimia publica* Cope, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 126 (Yucatán; two cotypes, U.S.N.M. nos. 16427-8); Barbour and Cole, Bull. Mus. Comp. Zool. 50: 153. 1906; Taylor, Proc. Biol. Soc. Washington 49: 53. 1936; Schmidt and Andrews, Field Mus. Nat. Hist., zool. ser., 20: 173-174. 1936; Hartweg and Oliver, Univ. Michigan Mus. Zool. Misc. Publ. 47: 23. 1940.

?*Ficimia olivacea* (*sensu lato, nec* Gray) Stuart, Univ. Michigan Mus. Zool. Misc. Publ. 29: 51. 1935.

*Ficimia variegata* (*nec* Günther) Taylor, Proc. Biol. Soc. Washington 49: 54. 1936.

*Diagnosis*.—Rostral in contact with frontal; internasals usually present (84 percent); two postoculars, or if only one, the other obviously fused with it or with supraocular; a dorsal pattern of distinct blotches or irregular bands, 21 to 35 on body, 7 to 11 on tail; centers of blotches usually lighter, edges black (all black only in southern [Honduras] specimens); length of blotches equal to two to four scale lengths; spaces between blotches never exceeding one and one-half times length of blotches, usually equal or less.

*Specimens examined*.—Fourteen. Partial data on four others.

*Range*.—Isthmus of Tehuantepec to western Honduras; on Pacific slopes only from the Isthmus of Tehuantepec to southern Guatemala.

*Locality records*.—CHIAPAS: La Esperanza, near Escuintla (U.S.N.M. no. 110296). OAXACA: Rancho Pozo Río (U.M.M.Z. no. 82594); La Concepción (U.S.N.M. no. 110298); Tehuantepec (U.S.N.M. no. 110297). VERACRUZ: Minatitlán (Taylor). YUCATÁN: Catmis (F.M.N.H. no. 26993); Chichen Itza (F.M.N.H. nos. 20623, 20653; M.C.Z., Barbour and Cole); Yucatán (U.S.N.M. nos. 16427-8; Brit. Mus.). GUATEMALA: ?La Libertad (U.M.M.Z., Stuart); Piedras Negras (U.S.N.M. no. 110295); Escuintla (U.S.N.M. 12688). HONDURAS: Ceiba (U.S.N.M. nos. 55237-8, 64986). One other record is Cuernavaca, Morelos (Brit. Mus.). While this may be correct, its distant removal from other localities represented by the species makes it questionable, until supported by other locality data. If the locality is correct, the specimen very likely may be referable to *ruspator*. It has internasals.

*Remarks*.—It is our belief that the chief character identifying this species and separating it from its nearest relatives is its pattern. It has less numerous blotches than *variegata* and *ruspator* (which have nearly identical patterns), and much broader and more regular ones than *streckeri*; *olivacea* has none.

The head markings show a great deal of variability. They are symmetrical and well defined in the Tehuantepec specimens, absent in the Honduras specimens, and present, although asymmetrical and not well defined, in the others.

The presence or absence of internasals is not an infallible, invariable character in this group. While *publia* is generally characterized by internasals present, the fact that one specimen has one internal partially fused with the prefrontal and another specimen has one internal on one side, leads us to believe that the two specimens lacking internasals on both sides are merely variants of *publia*. The latter two specimens show no differences in pattern, and no differences we can consider significant in scutellation, from other *publia*. Both occur within the expected range of *publia*.

Species in which the internasals have been lost do not show a variation like that which occurs in *publia*: 14 specimens of these species (*streckeri*, *olivacea*, *variegata*) show the occurrence of an internal but once (on one side of one *olivacea*). Since the trend in this genus is toward loss of these scales, it is to be expected that the variation should occur in those retaining the scales distinct (*publia*, *ruspator*), not in those in which they are lost; distinct internasals are an anomaly in the latter, but the lack of them in the former is merely evidence of a well-established generic trend. This fact is one of the chief reasons that *ruspator* is held distinct from *variegata*, which is known to normally lack internasals (none in four specimens).

As shown in Table 2, the relative width and length of frontal, rostral, and frontal-rostral suture seem to have no great significance in *publia*, except that the frontal-rostral suture may be broader in younger specimens, and that the rostral is generally a little shorter than the frontal.

If other forms are distinguished in the future among the specimens here referred to *publia*, we believe they will be subspecies distinguished by features of the color pattern. The most distinct population now discernible is that of Honduras; the three specimens from that country have the blotches bandlike and of uniform color throughout, the ground color light (not darkened), and very few lateral marks. All other *publia* have the blotches distinctly light centered; the condition of the Honduras specimens is closely



TABLE 2.—VARIATION IN *FICIMIA PUBLIA*

Number	Sex	Ventrals	Caudals	Supral.	Infral.	Proc.	Ptroc.	Intern.	Rostrofrontal suture	Rostral width	Rostral length	Frontal length	Body spots	Tail spots	Gen. loc.
									mm	mm	mm	mm			
55237	♂	144	38	7-7	8-8	1-1	2-1	0-1	0.9	2.0	2.3	3.0	28	9	Honduras
55238	♂	144	39	7-7	7-8	1-1	2-1	1-1	1.0	1.9	2.8	3.1	31	10	Honduras
Stuart	♂	135	36												Peten
110295	♂	146	38	7-7	8-8	1-1	2-2	1-½	1.2	2.8	4.0	4.0	27	8	Peten
16428	♂	134	33	7-7	7-7	1-1	2-2	1-1	0.7	2.0	2.8	2.8	31	11	Yucatán
26993	♂	136	37	7-7	7-7	1-1	1-2	0-0					25	8	Yucatán
M.C.Z.	♂?	145	37					1-1					26	9	Yucatán
Brit. M.	♂?	142	36			1-1	2-2	1-1							Yucatán
82594	♂	143	36	7-7	7-7			1-1					25	8	Tehuantepec
64986	♀	156	35	7-7	7-8	1-1	1-2	1-1	0.9	1.8	2.1	2.9	30	9	Honduras
16427	♀	138	30	7-7	7-8	1-1	2-2	1-1	0.7	1.9	2.6	2.7	31	10	Yucatán
20623	♀	148	35	7-7	7-7	1-1	2-2	1-1					26	9	Yucatán
20635	♀	151	32	7-7	6.7	1-1	2-2	1-1					25	7	Yucatán
Rickard	♀	155	34	7-7	7-7	1-1	1-1	0-0			5.1	4.4	32	9	Veraacruz
110297	♀	148	32	7-7	7-7	1-1	2-2	1-1	1.7	1.9	2.0	2.2	21	7	Tehuantepec
110298	♀	152	37	7-7	8-8	1-1	2-2	1-1	1.0	1.8	2.0	2.2	25	7	Tehuantepec
110296	♀	153	36	7-7	7-8	1-1	2-2	1-1	1.2	2.8	4.5	3.8	31	8	Chiapas
12688	♀	154	32	7-7	8-8	1-1	2-2	1-1	0.9	2.1	3.8	3.5	35	9	Guatemala
Brit. M.	♀	142	35					0-0							"Mexico"

approached by the Piedras Negras specimen, in which the blotches are almost entirely black. We have refrained from naming the Honduras specimens because it appears certain that, if they are recognized, then the remainder of *publia* should be split: the Yucatán specimens have few marks on the sides; the Escuintla specimen has the blotches bandlike; and the remainder have the blotches split laterally (not forming crossbands), numerous lateral spots, and adults have the ground color darkened. Until these pattern types are known from many more specimens, and the limits of variation can be more definitely established, it is impossible to diagnose subspecies in *publia* with any degree of certainty.

***Ficimia ruspator* sp. nov.**

Figs. 5, 10, 12

?*Ficimia publia* Boulenger, Cat. Snakes Brit. Mus. 2: 271. 1894. (*part.*; the Cuernavaca specimen).

*Holotype*.—E. H. Taylor—H. M. Smith collection no. 23646, female, 3 miles east of Tixtla (about 10 miles east of Chilpancingo), Guerrero.

*Diagnosis*.—Similar to *Ficimia publia*, but blotches on body 43, on tail 11. Similar to *Ficimia variegata*, but internasals present. Two postoculars; blotches narrow, tending to be light-centered; ventrals 154; caudals 33.

*Description of holotype*.—Rostral large, elongate, its suture with frontal subequal to sutures between latter and prefrontals; rostral sharply upturned anteriorly, the ridge bordered posteriorly by a shallow depression; length of rostral from anterior ridge to frontal (2.3 mm) distinctly greater than length of frontal (2.0 mm), very slightly greater than length of median parietal suture; nasal narrow, anterior section fused with first labial; prefrontal in contact with second labial; preocular single, large; two postoculars, lower

smaller; one elongate, narrow, anterior temporal; two (three) tertiary temporals; seven supralabials, all relatively high, sixth largest, fourth next largest, third and fourth contacting orbit, seventh slightly larger than lower tertiary temporal; diameter of orbit nearly as great (five-sixths) as its distance from labial border, little less than half its distance from tip of snout; seven infralabials, fourth largest, three in contact with anterior chinshields; posterior chinshields practically indistinguishable, separated medially by two scales, somewhat larger than gular scales, in contact with two labials.

Scales in 17 rows throughout, smooth, with single apical pits; ventrals 154; anal divided; caudals 33. Total length 144 mm; tail 20 mm.

*Color*.—General color light gray; body with 43 transverse, black blotches, some of the anterior blotches with dimly lighter (brown) centers; blotches broken on sides of body at about fifth scale row; below this sides with irregular black spots and vertical streaks, some rarely confluent with dorsal blotches, some involving ends of ventrals; spaces between blotches about equal to length of blotches or slightly less (one and one-half to two scale lengths, middorsal line); tail with 11 dorsal crossbars, sides with a very few spots. Top of head somewhat brownish gray, with numerous irregular black marks; a large dark spot under eye, reaching lip; labial sutures dark. Infralabial sutures dark stippled, the markings not distinct; no other gular marks; some spots on sides of body involving ends of ventral; a little scattered stippling on sides of belly; otherwise ventral surfaces unspotted, white.

*Remarks*.—Aside from the "Cuernavaca" record of Boulenger, which is open to much doubt, the type of *ruspator* is the only specimen of *Ficimia* known from the Pacific slopes of Mexico north (west) of Tehuantepec. The fact that this area faunistically is much different from the area in Chiapas and southeastern Oaxaca inhabited by *variegata*; that the range of the latter species is separated from the presumed range of *ruspator* by an area (Tehuantepec) occupied by *publia*; that species of *Ficimia* normally lacking internasals very rarely (if ever) have them on both sides (it is the reverse that frequently occurs); and that *Ficimia* tends to differentiate in each different area it inhabits, leads us to believe that the single specimen and type of *ruspator* may be normal and represent a form different from *variegata* (by presence of internasals) and *publia* (by more numerous blotches). If further specimens prove to lack internasals usually, then the concept of the range of *variegata* must be extended to include this area, in spite of the fact that it is split in the Tehuantepec area by the range of *publia*. That we do not believe this will prove to be the case is implied by the fact that the Guerrero specimen is here named. We believe that *ruspator* and *variegata* are of independent origin (from *publia*, however), and that the parallelism between the two in pattern is explicable by the orthogenetic trend in the genus toward reduction in size and increase in number of the blotches. Probably *streckeri* passed through the same stage in its pattern evolution, which in it has gone still farther and produced very narrow, irregular bands. The fact that *variegata* has lost the internasals while *ruspator* retains them indicates a possibly greater age for the former.

The parallelism between *ruspator* and *variegata* is remarkably similar to that occurring in *Conopsis lineatus* and *C. pulcher*.

#### *Ficimia variegata* (Günther)

*Amblymetopon variegatum* Günther, Cat. Snakes Brit. Mus., pp. 7-8. 1858 (Mexico).

?*Ficimia olivacea* Steindachner, Sitzb. Akad. Wiss. Berlin 61: 19. 1870; Günther, Biol. Centr. Amer., Rept., p. 98. 1893 (part), pl. 35, fig. C; Boulenger, Cat. Snakes Brit. Mus. 2: 272. 1894 (part).

*Diagnosis*.—Rostral in contact with frontal; apparently no internasals normally; two postoculars normally; pattern consisting of 45 to 56(?) band-like blotches on body, about 16 on tail; bands covering one and one-half to two scale lengths medially; spaces between bands about equal to length of bands.

*Specimens examined*.—One. Four known.

*Range*.—Mountains of central Chiapas and eastern Oaxaca (i.e., east of the Isthmus of Tehuantepec).

*Locality records*.—The single specimen examined is from Guichicovi, Oaxaca. If the Steindachner specimen from "Tustla" is properly associated with this species, the locality more correctly may be Tuxtla Gutierrez, Chiapas (as previously stated by one of us Taylor, *loc. cit.*, 1936, p. 54]). The cotypes collected by Sallé very likely came from this same region, as a number of other species of reptiles collected by him are now known to be restricted to that area.

*Remarks*.—If *variegata* has any significance whatever, the name must be applied to specimens with a large number of dorsal blotches. The fact that the four specimens now known with numerous blotches all appear to have originated from a rather well-defined area not occupied by other members of the genus (except perhaps *olivacea*, the range of which may overlap that of *variegata*), correlated with the fact that all four lack internasals while the species' closest relatives (*publia*, *ruspator*) normally have them (in spite of the general trend in the genus toward elimination of them), indicates a natural association and not a purely arbitrary one.

The specimen examined has 48 bands on the body, 16 on the tail. Descriptions of other specimens of the species unfortunately do not make clear whether the band count given is the total number or only those on the body. The figure in Günther (Biol. Centr. Amer.) of one of the cotypes shows about 45 on the body, about 16 on the tail (total 61). However, Günther states that there are "51 to 56 of these crossbars," but leaves indefinite what these numbers represent. Since neither number corresponds either to body or total blotches shown in the figure, perhaps the latter is incorrectly executed. The original description does not clarify the situation, as the specimen described in detail is merely said to have "56 black narrow cross bars."

The Guichicovi specimen is a female; ventrals 152; caudals 36; supra-labials 7-7; preoculars 1-1; postoculars 1-2 (upper fused with supraocular on one side); no internasals; rostro-frontal suture 1.2 mm; rostral width 2.7 mm; rostral length 3.8 mm; frontal length 3.9 mm. The two specimens in the British Museum (a juvenile and a female) have 160 and 149 ventrals, respectively, 37 and 36 caudals; both have 1-1 preoculars and 2-2 postoculars.

#### *Ficimia olivacea* Gray

Figs. 4, 9, 13

*Ficimia olivacea* Gray, Cat. Snakes Brit. Mus., p. 80. 1849 (Mexico); Sumichrast, La Naturaleza 6: 41. 1882; Taylor, Proc. Biol. Soc. Washington 49: 52-53. 1936.

*Diagnosis*.—Rostral in contact with frontal; internasals normally absent; two postoculars, or if only one, the other obviously fused with it or with supraoculars; uniform dark gray or brown above, no evidence of transverse markings.

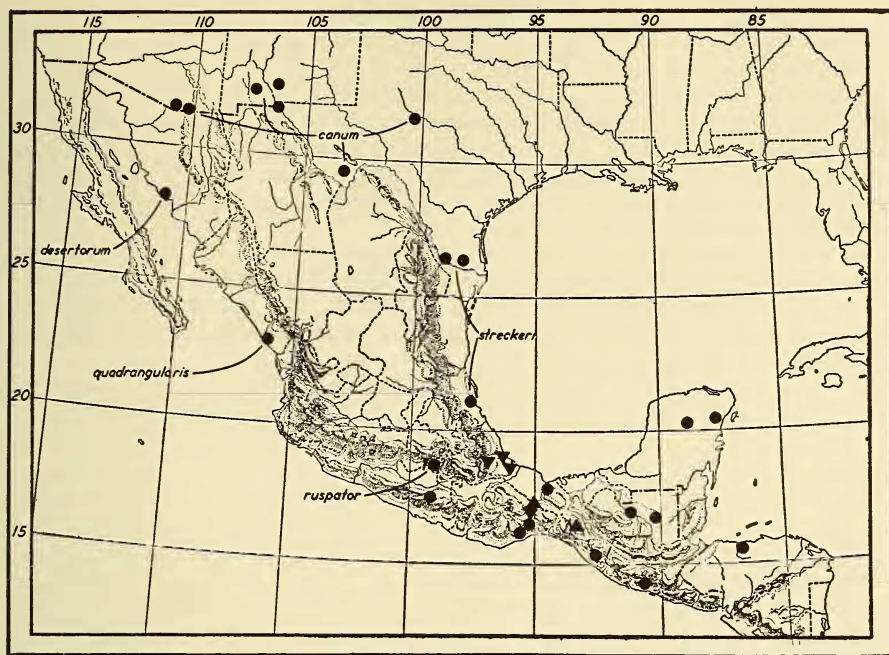


Fig. 17.—Geographic distribution of the species of *Gyalopion* and *Ficimia*. Inverted triangles, *olivacea*; triangles not inverted, *variegata*; solid circles not otherwise indicated, *publia*.

*Specimens examined*.—Four. Two others reported.

*Range*.—Central and southern Veracruz in coastal regions and low hills (not to coast in extreme southern Veracruz); northeastern Oaxaca.

*Locality records*.—OAXACA: El Barrio, near Lagunas (U.S.N.M. no. 30131). VERACRUZ: Orizaba (U.S.N.M. no. 6329); Otopa (F.M.N.H. no. 1315); Tierra Colorada (EHT-HMS 2194).

*Remarks*.—The species is well defined, since it is the only one without dorsal spots.

TABLE 3.—VARIATION IN *FICIMIA OLIVACEA*

Number	Sex	Ventrals	Caudals	Supral.	Infral.	Proc.	Ptoc.	Intern.
6329	♂	140	37	7-7	7-7	1-1	2-2	0-0
Brit. M.	♂	152	42			1-1	2-2	0-0
Brit. M.	♂	150	41			1-1	2-2	0-1
2194	♂	142	38	7-7	7-7	1-1	2-2	0-0
30131	♀	146	37	7-7	7-7	1-1	2-2	0-0
1315	♀	142	37	7-7	7-7	1-1	2-2	0-0

Maxilla (no. 6329) with 15 subequal teeth, almost all with moderately well defined, lateral grooves. Hemipenis of same specimen nine caudals long, distal half calyces; nearly all of remainder with spines, increasing in size proximally and terminating with two larger basal spines; extreme basal portion ridged, spineless; sulcus single.

**Ficimia streckeri** Taylor

Figs. 3, 8, 14

*Ficimia streckeri* Taylor, Copeia, 1931, no. 1, pp. 5-7 (3 miles east of Rio Grande City, Tex.).

*Diagnosis.*—Rostral in contact with frontal; normally no internasals; one postocular; pattern consisting of numerous (38 to 47), narrow, frequently irregular, dark brown or black cross-bars; these covering about one scale length or less, and separated from each other by about three times their own length; bands sometimes very broken posteriorly, remaining evident chiefly as small, middorsal spots.

*Specimens examined.*—Three, including type.

*Range.*—Extreme southern Texas to northern Veracruz.

*Locality records.*—TEXAS: Edinburg (U.S.N.M. no. 101051); 3 miles east of Rio Grande City (K.U. no. 4140). VERACRUZ: Tuxpam (U.S.N.M. nos. 25201-2).

TABLE 4.—VARIATION IN *FICIMIA STRECKERI*

Number	Sex	Ventrals	Caudals	Supral.	Infral.	Proc.	Ptoc.	Intern.
25201	♂	144	37	7-7	7-7	1-1	1-1	0-0
25202	♀	149	29	7-7	7-7	1-1	1-1	0-0
101051	♀	143	33	7-7	7-7	1-1	1-1	0-0
4140	♀	144	30	7-7	8-8	1-1	1-1	0-0

*Remarks.*—The very narrow, dorsal cross bands, separated from each other by a distance about three times their own length, characterize this species and differentiate it from all others. The single postocular is also unique. In other species the two postoculars may be fused together, or one fused with the supraoculars, but in all such cases the fusion is obvious.

KEY TO GYALOPION AND *FICIMIA*

1. Rostral separated from frontal. . . . . *Gyalopion* . . . . . 2  
 Rostral in contact with frontal. . . . . *Ficimia* . . . . . 4
2. Dark markings on head and middorsum brown, black-edged; head markings variable, not a single large blotch fused with first nuchal spot . . . . . *G. canum*  
 Dark markings on head and middorsum uniform black; a large black spot on head, fused with first nuchal spot. . . . . 3
3. Markings restricted to middorsum, not extending onto sides of body; 26 spots on body; no loreal. . . . . *G. quadrangularis*  
 Markings extending onto sides of body to ends of ventrals; 32 spots on body; a loreal. . . . . *G. desertorum*
4. No dorsal markings whatever; usually two postoculars; usually no internasals. . . . . *F. olivacea*  
 Dorsal bands present; one or two postoculars; internasals present or absent. . . . . 5
5. Dorsal bands very narrow (a scale length or less), separated from each other by about three times their length; one postocular; no internasals . . . . . *F. streckeri*  
 Dorsal bands longer (one and one half or more scale lengths), separated from each other by no more than one and one half times their length; two postoculars usually; internasals present or absent. . . . . 6
6. Bands on body 21 to 35; internasals usually present. . . . . *F. publia*  
 Bands on body 43 or more; internasals present or absent. . . . . 7
7. Internasals present. . . . . *F. ruspator*  
 Internasals absent. . . . . *F. variegata*